

It is known to calibrate IR cameras by taking readings from each element when one or more reference surfaces at different temperatures are presented to the camera. These readings are then used to calibrate the camera. For robust and accurate calibration, it is necessary to present surfaces generating flux levels covering the range of those which may be encountered in the scenes to be imaged. However, the provision of a sufficiently cold reference surface to generate the low flux levels equivalent to scenes often encountered in practice requires substantive cooling of the reference surface. This can be expensive and difficult to achieve.

It is therefore an object of the present invention to provide a calibration system which overcomes the need to cool the reference surface.

In accordance with one aspect of the present invention, there is provided a reference surface for use in the calibration of infra red detectors, the reference surface comprising a plurality of hollow corner cubes which are partially reflective and partially emissive.

In accordance with another aspect of the present invention, there is provided a method of calibrating an infra red detector comprising a plurality of detector elements using a reference surface as described above, the method comprising:-

a) presenting the reference surface at a known temperature to an infra red detector;

b) measuring the output of each detector element;

c) comparing the measured output of each detector element with a nominal output for the known temperature to determine a calibration error at the known temperature; and

d) heating the reference surface to one or more further known temperatures and repeating steps b) and c) to determine a calibration error for each of the further known reference temperatures.

For a better understanding of the present invention, reference will now be made, by way of example only, to the accompanying drawings in which:-

**CLAIMS:**

1. A reference surface for use in the calibration of infra red detectors, the reference surface comprising a plurality of hollow corner cubes which are partially reflective and partially emissive.  
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2. A reference surface according to claim 1, wherein each corner cube comprises a reflective surface and a matt surface to form an effective surface emissivity of N%.
3. A reference surface according to claim 2, wherein the reflective surface comprises a silvered surface.  
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4. A reference surface according to claim 2, wherein the reflective surface comprises an aluminised surface.
5. A reference surface according to any one of claims 2 to 4, wherein the matt surface comprises a matt black paint overlying the reflective surface.
- 15 6. A reference surface according to any one of claims 2 to 4, wherein the matt surface comprises a non-reflective surface etched into the reflective surface.
7. A method of calibrating an infra red detector comprising a plurality of detector elements using a reference surface according to any one of the preceding claims, the method comprising:-  
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  - a) presenting the reference surface at a known temperature to an infra red detector;
  - b) measuring the output of each detector element;
  - c) comparing the measured output of each detector element with a nominal  
25 output for the known reference surface temperature to determine a calibration error at the known temperature; and

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- d) heating the reference surface to one or more further known temperatures and repeating steps b) and c) to determine a calibration errors for each of the further known temperatures.
- 5 8. A method according to claim 7, further comprising the step of calculating a function relating the output error of each detector element to the temperature of the reference surface.
9. A method according to claim 8, wherein the function is a polynomial function.
- 10 10. A method according to any one of claims 7 to 9, further comprising the step of storing the calibration constants for application to readings obtained from the detector.
11. A reference surface substantially as hereinbefore described with reference to the accompanying drawings.
- 15 12. A method of calibrating an infra red detector substantially as hereinbefore described with reference to Figure 4 of the accompanying drawings.

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